

REMARKS

The Applicant respectfully requests further examination and consideration in view of the amendments above and the arguments set forth fully below. Prior to this Office Action, Claims 1, 3-6, 9-19, 22-28, 30-33, and 36-60 were pending in this application. Within the Office Action, Claims 1, 3-6, 9, 15-19, 22, 28, 30-33, 36, 42-44, 46-50, 52-56, and 58-60 are rejected, and Claims 10-14, 23-27, 37-41, 45, 51, and 57 are objected to. By the above amendments, Claims 1, 9, 15, 22, 28, and 36 are amended. Accordingly, Claims 1, 3-6, 9-19, 22-28, 30-33, and 36-60 are currently pending in this application.

Rejections Under 35 U.S.C. § 102

Within the Office Action, Claims 1, 3, 4, 9, 15-17, 22, 28, 30, 31, 36, 43, 44, 46, 49, 50, 52, 55, 56, 58, and 60 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,785,252 to Zimmerman et al. (hereinafter "Zimmerman"). The Applicant respectfully traverses these rejections.

The present invention allocates a queue in a weighted fair queue to generate contention slots, where each contention slot is designated for either the request and grant mode or the contention mode. Idle end user nodes (EUNs) utilize a contention slot designated for contention mode to request access. All EUNs are grouped into virtual groups, and an upstream (from EUN to a hub) contention mode contention slot is announced to all EUNs within a given virtual group via a grant from the hub using a multicast addressing mode. If a collision occurs between two idle end user nodes requesting access using the contention slot designated for contention mode, two new contention slots designated for request and grant mode are generated, and the newly generated slots are placed in the weighted fair queue. The previously idle EUNs are now considered active EUNs, where each active EUN utilizes a request and grant contention slot. Each active EUN corresponds to a single request and grant contention slot, such that the number of active EUNs and the number of request and grant contention slots form a one to one relationship.

The number of contention slots designated for request and grant mode increases and decreases according to the number of EUN access requests. However, the number of contention slots designated for contention mode remains a fixed, constant number. In the preferred case, the number of contention mode contention slots is one. In this case, the number of request and grant

mode contention slots will vary based on the number of access requests, but the number of contention mode contention slots remains fixed at one.

Zimmerman teaches a method and apparatus for allocating bandwidth within a wireless network. Customer Premise Equipment (CPEs) 110 request bandwidth from base stations 106. The base stations 106 receive these requests for transmission rights and grant these requests taking into account the priorities, service types, and quality of service associated with the CPEs 110. Services, as used within Zimmerman, refers to the manner of data transmission, such as real-time transmission over voice trunks or bursty data transmission over the internet. A base station MAC allocates bandwidth for the transmission requests. The available bandwidth is allocated in units of a certain pre-defined number of PS (physical slots) 204 (Zimmerman, col. 10, lines 43-45). A plurality of physical slots 204 are assigned to each transmission request. A CPE 110 can request that additional physical slots 204 (bandwidth) are added to a particular transmission link in order to accommodate increased bandwidth requirements. Zimmerman refers to such additional requests as incremental bandwidth requests. Periodically, the CPE 110 transmits an aggregate bandwidth request to reset the base station 106 to reflect immediate total bandwidth requirements of their associated CPEs 110. In summary, Zimmerman teaches that a transmission link between a CPE 110 and a base station 106 is allocated a plurality of physical slots 204, the exact amount of physical slots 204 varying based on additional bandwidth requests made by the CPE 110. As additional transmission bandwidth requests are made by the individual CPE 110, more physical slots 204 are allocated to the existing transmission link between the CPE 110 requesting the additional bandwidth and the base station 106. Zimmerman does not teach a bandwidth allocation method that when a contention occurs between two CPEs requesting bandwidth, an additional transmission link, or channel, is generated such that each CPE is allocated a dedicated transmission link with the base station. In other words, Zimmerman does not teach dynamically allocating transmission links on a per user basis when contention occurs. Zimmerman teaches allocating physical slots of bandwidth to an existing transmission link, where the existing transmission link corresponds to a given user requiring additional bandwidth.

The amended independent Claim 1 is directed to a method of integrating a scheduling algorithm in a wireless network shared by a plurality of users. The method includes generating one or more contention slots, allocating a first number of contention slots according to a request and grant mode, wherein the first number is determined by a number of user access requests, further wherein each one of the number of user access requests corresponds to a different one of

the first number of contention slots, allocating a second number of contention slots according to a contention mode, prioritizing the first number of contention slots and the second number of contention slots, and dynamically adjusting the first number of contention slots according to a change in the number of users requesting access. As discussed above, Zimmerman teaches allocating physical slots of bandwidth to an existing transmission link corresponding to a given user. Zimmerman does not teach allocating contention slots on a per user basis. For at least these reasons, the independent Claim 1 is allowable over Zimmerman.

Claims 3, 4, 9, 43, 44, and 46 are dependent on the independent Claim 1. As discussed above, Claim 1 is allowable over the teachings of Zimmerman. Accordingly, Claims 3, 4, 9, 43, 44, and 46 are each also allowable as being dependent upon an allowable base claim.

The amended independent Claim 15 is directed to an apparatus for integrating a scheduling algorithm in a wireless network shared by a plurality of users. The apparatus includes means for generating one or more contention slots, means for allocating a first number of contention slots according to a request and grant mode, wherein the first number is determined by a number of user access requests, further wherein each one of the number of user access requests corresponds to a different one of the first number of contention slots, means for allocating a second number of contention slots according to a contention mode, means for prioritizing the first number of contention slots and the second number of contention slots, and means for dynamically adjusting the first number of contention slots according to a change in the number of users requesting access. As discussed above, Zimmerman teaches allocating physical slots of bandwidth to an existing transmission link corresponding to a given user. Zimmerman does not teach allocating contention slots on a per user basis. For at least these reasons, the independent Claim 15 is allowable over Zimmerman.

Claims 16, 17, 22, 49, 50, and 52 are dependent on the independent Claim 15. As stated above, Claim 15 is in a condition for allowance. Accordingly, Claims 16, 17, 22, 49, 50, and 52 are each also allowable as being dependent upon an allowable base claim.

The amended independent Claim 28 is directed to an apparatus for integrating a scheduling algorithm in a wireless network channel shared by a plurality of users. The apparatus includes a hub for transmitting and receiving wireless network signals such that the hub may receive requests and assign portions of a communication bandwidth, a plurality of end user nodes for transmitting and receiving wireless network signals such that a plurality of users may request or be granted a portion of the communication bandwidth, and a weighted fair queue for utilizing an adaptive contention scheduling scheme to generate one or more contention slots, to allocate a

first number of contention slots according to a request and grant mode, wherein the first number is determined by a number of user access requests, each one of the number of user access requests corresponds to a different one of the first number of contention slots, to allocate a second number of contention slots according to a contention mode, to prioritize the first number of contention slots and the second number of contention slots, and to dynamically adjusting the first number of contention slots according to a change in the number of active users requesting access, and according to the number of idle users requesting access via the contention mode. As discussed above, Zimmerman teaches allocating physical slots of bandwidth to an existing transmission link corresponding to a given user. Zimmerman does not teach allocating contention slots on a per user basis. For at least these reasons, the independent Claim 28 is allowable over Zimmerman.

Claims 30, 31, 36, 55, 56, 58, and 60 are dependent on independent Claim 28. As stated above, Claim 28 is in a condition for allowance. Accordingly, Claims 30, 31, 36, 55, 56, 58, and 60 are also in a condition for allowance.

Within the Office Action, Claims 5, 6, 18, 19, 32, and 33 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Zimmerman in view of U.S. Patent No. 6,381,228 to Prieto, Jr. et al. (hereinafter "Prieto"). The Applicant respectfully traverses these rejections.

Claims 5 and 6 are dependent on independent Claim 1. Claims 18 and 19 are dependent on independent Claim 15. Claims 32 and 33 are dependent on independent Claim 28. As stated above, Claim, 1, 15, and 28 are in a condition for allowance. Accordingly, Claims 5, 6, 18, 19, 32, and 33 are each also allowable as being dependent upon an allowable base claim.

Within the Office Action, Claims 42, 47, 48, 53, 54, and 59 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Zimmerman. The Applicant respectfully traverses these rejections.

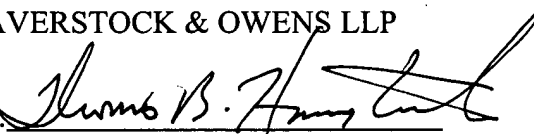
Claims 42 and 47 are dependent on independent Claim 1. Claims 48 and 53 are dependent on independent Claim 15. Claims 54 and 59 are dependent on independent Claim 28. As stated above, Claims 1, 15, and 28 are in a condition for allowance. Accordingly, Claims 42, 47, 48, 53, 54, and 59 are each also allowable as being dependent upon an allowable base claim.

Within the Office Action, it is stated that Claims 10-14, 23-27, 37-41, 45, 51, and 57 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims.

For the reasons given above, Applicant respectfully submits that the claims are in a condition for allowance, and allowance at an early date would be appreciated. Should the Examiner have any questions or comments, the Examiner is encouraged to call the undersigned at (408) 530-9700 to discuss the same so that any outstanding issues can be expeditiously resolved.

Respectfully submitted,
HAVERSTOCK & OWENS LLP

Dated: 11-23-04

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CERTIFICATE OF MAILING (37 CFR § 1.3(a))

I hereby certify that this paper (along with any referred to as being attached or enclosed) is being deposited with the U.S. Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to the: Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450

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